

LISTING OF CLAIMS

1. (Previously Presented) A hydraulic system for mining equipment comprising:
 - at least one hydraulic circuit with pressure fluid channels and at least one hydraulic pump, the hydraulic pump being arranged to generate hydraulic power in the hydraulic circuit;
 - at least one power unit for driving the hydraulic pump;
 - at least one hydraulic mining actuator connected to the hydraulic circuit and configured to act on a tool in the mining equipment;
 - at least one hydraulic auxiliary actuator connected to the hydraulic circuit; and
 - means for adjusting the hydraulic power to be led to the mining actuator and the auxiliary actuator connected to the hydraulic circuit, wherein
 - the hydraulic system comprises a main hydraulic circuit and at least one separate hydraulic circuit, and the main hydraulic circuit and each separate hydraulic circuit are operationally separate from each other, each having a separate hydraulic pump for generating hydraulic power; at least one mining actuator is connected to the separate hydraulic circuit and said mining actuator is configured to be driven by the hydraulic power acting in the separate hydraulic circuit; and
 - the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the power of the drilling actuator connected to the separate hydraulic circuit by adjusting the generated hydraulic power by adjusting the pumping output of the hydraulic pump.

2. (Previously Presented) A hydraulic system as claimed in claim 1, wherein the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the hydraulic pressure generated by the hydraulic pump comprised by the separate hydraulic circuit.

3. (Previously Presented) A hydraulic system as claimed in claim 1, wherein the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the hydraulic flow generated by the hydraulic pump comprised by the separate hydraulic circuit.

4. (Previously Presented) A hydraulic system as claimed in claim 1, wherein the mining actuator is selected from the group consisting of: a percussion device arranged to generate impact pulses in the tool connected to the mining equipment; a rotation device arranged to rotate the tool connected to the mining actuator relative to its axis; and a feed device arranged to push the tool connected to the mining actuator in the axial direction.

5. (Previously Presented) A hydraulic system as claimed in claim 4, wherein the mining actuator is a percussion device, the percussion device is connected to a first separate hydraulic circuit having a percussion device-specific first hydraulic pump, and the power of the percussion device is arranged to be adjusted by adjusting said hydraulic pump.

6. (Previously Presented) A hydraulic system as claimed in claim 1, wherein the hydraulic system comprises a plurality of mining actuators that each mining actuator is connected to a dedicated separate hydraulic circuit, and the power of each mining actuator is arranged to be adjusted by acting on the hydraulic pump comprised by said separate hydraulic circuit.

7. (Previously Presented) A hydraulic system as claimed in claim 6, wherein the hydraulic pump of each separate hydraulic circuit is arranged to be driven by a dedicated power unit and the hydraulic power acting in each separate hydraulic circuit is arranged to be adjusted by acting on the speed of rotation of the hydraulic pump by means of the power unit.

8. (Previously Presented) A hydraulic system as claimed in claim 1, wherein at least one separate hydraulic circuit comprises a pressure fluid tank separate from the other hydraulic circuits, the pressure fluid of said separate hydraulic circuit being arranged separate from the pressure fluids of the other hydraulic circuits.

9. (Previously Presented) A hydraulic system as claimed in claim 1, wherein the hydraulic system comprises a plurality of separate hydraulic circuits, and the separate hydraulic circuits have a common pressure fluid tank separate from the main hydraulic circuit the common pressure fluid used in the separate hydraulic circuits being arranged separate from the pressure fluid of the main hydraulic circuit.

10. (Previously Presented) A hydraulic system as claimed in claim 1, wherein the hydraulic power acting in the separate hydraulic circuit is arranged to be adjusted by changing the displacement capacity of the hydraulic pump comprised by said separate hydraulic circuit.

11. (Previously Presented) A method of adjusting the power of a rock drill machine, the rock drill machine comprising at least the following drilling actuators: a percussion device a rotation device and a feed device of which at least one is connected to a hydraulic circuit method comprising:

generating hydraulic power in said hydraulic circuit with at least one hydraulic pump;

driving the drilling actuator connected to the hydraulic circuit by the hydraulic power acting in the hydraulic circuit;

adjusting the power of the drilling actuator connected to the hydraulic circuit by adjusting the hydraulic power to be fed to the drilling actuator;

adjusting the power of the drilling actuator connected to the hydraulic circuit mainly by adjusting the pumping output of the hydraulic pump.

12. (Previously Presented) A method as claimed in claim 11, further comprising adjusting the pumping of the hydraulic pump by adjusting the displacement capacity of the pump.

13. (Previously Presented) A method as claimed in claim 11, further comprising adjusting the pumping of the hydraulic pump by adjusting the speed of rotation of the pump.

14. (Previously Presented) A method as claimed in claim 11, further comprising adjusting the pumping of the hydraulic pump by adjusting the speed of rotation and the displacement capacity of the pump.

15. (Previously Presented): A hydraulic system as claimed in claim 1, wherein the means for adjusting the hydraulic power of the mining actuator connected to the separate hydraulic circuit are arranged in connection with the hydraulic pump of the separate hydraulic circuit.

16. (Previously Presented): A hydraulic system as claimed in claim 1, wherein the hydraulic pump of the separate hydraulic circuit is controlled by means of a control unit including an adjustment strategy,
the hydraulic circuit includes a rock drill machine comprising a percussion device and a rotation device, both being connected to the separate hydraulic circuit,
the pressure of the fluid channel leading from the pump to the mining actuator of the rock drilling machine is monitored by means of a sensor,
the information on the pressure obtained from the sensor is transmitted to the control unit,

and the power of the mining actuator of the rock drilling machine is controlled according to the pressure information and the adjustment strategy.

17. (Previously Presented): A hydraulic system as claimed in claim 1, wherein

the hydraulic pump of the separate hydraulic circuit is controlled by means of a control unit including an adjustment strategy,

the hydraulic circuit includes a rock drill machine comprising a percussion device and a rotation device, both being connected to the separate hydraulic circuit,

the pressure of the fluid channel leading from the pump to the mining actuator of the rock drilling machine is monitored by means of a sensor,

the information on the pressure obtained from the sensor is transmitted to the control unit,

the information on the volume flow obtained from the hydraulic pump of the separate hydraulic circuit is monitored,

and the power of the mining actuator of the rock drilling machine is controlled according to the pressure and flow information and the adjustment strategy.

18. (Previously Presented): A hydraulic system as claimed in claim 1, wherein

the hydraulic pump of the separate hydraulic circuit is controlled by means of a control unit including an adjustment strategy,

the hydraulic circuit includes a rock drill machine comprising a percussion device and a rotation device, which both are connected to the separate hydraulic circuit,

at least one sensor is arranged in connection with the rock drilling machine for monitoring the operation of the mining actuator,

the results of the monitoring are transmitted from the at least one sensor to the control unit,

and the power of the mining actuator of the rock drilling machine is controlled according to the monitoring results and the adjustment strategy.

19. (Previously Presented): A hydraulic system for mining equipment comprising:

at least one hydraulic circuit with pressure fluid channels and at least one hydraulic pump, the hydraulic pump being arranged to generate hydraulic power in the hydraulic circuit;

at least one power unit for driving the hydraulic pump;

at least one hydraulic mining actuator connected to the hydraulic circuit and configured to act on a tool in the mining equipment;

at least one hydraulic auxiliary actuator connected to the hydraulic circuit; and

means for adjusting the hydraulic power to be led to the mining actuator and the auxiliary actuator connected to the hydraulic circuit, wherein

the hydraulic system comprises a main hydraulic circuit and at least one separate hydraulic circuit, and the main hydraulic circuit and each separate hydraulic circuit are operationally separate from each other, each having a separate hydraulic pump for generating hydraulic power; at least one mining actuator is connected to the separate hydraulic circuit and

said mining actuator is configured to be driven by the hydraulic power acting in the separate hydraulic circuit; and

the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the power of the drilling actuator connected to the separate hydraulic circuit by adjusting the generated hydraulic power by adjusting the pumping output of the hydraulic pump, wherein

the hydraulic pump of the separate hydraulic circuit is controlled by means of a control unit including an adjustment strategy,

the hydraulic circuit includes a rock drill machine comprising a percussion device and a rotation device, both being connected to the separate hydraulic circuit,

the pressure of the fluid channel leading from the pump to the mining actuator of the rock drilling machine is monitored by means of a sensor,

the information on the pressure obtained from the sensor is transmitted to the control unit,

the information on the volume flow obtained from the hydraulic pump of the separate hydraulic circuit is monitored,

and the power of the mining actuator of the rock drilling machine is controlled according to the pressure and flow information and the adjustment strategy.

20. (Previously Presented): A hydraulic system for mining equipment comprising:

at least one hydraulic circuit with pressure fluid channels and at least one hydraulic pump, the hydraulic pump being arranged to generate hydraulic power in the hydraulic circuit;

at least one power unit for driving the hydraulic pump;

at least one hydraulic mining actuator connected to the hydraulic circuit and configured to act on a tool in the mining equipment;

at least one hydraulic auxiliary actuator connected to the hydraulic circuit; and

means for adjusting the hydraulic power to be led to the mining actuator and the auxiliary actuator connected to the hydraulic circuit, wherein

the hydraulic system comprises a main hydraulic circuit and at least one separate hydraulic circuit, and the main hydraulic circuit and each separate hydraulic circuit are operationally separate from each other, each having a separate hydraulic pump for generating hydraulic power; at least one mining actuator is connected to the separate hydraulic circuit and said mining actuator is configured to be driven by the hydraulic power acting in the separate hydraulic circuit; and

the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the power of the drilling actuator connected to the separate hydraulic circuit by adjusting the generated hydraulic power by adjusting the pumping output of the hydraulic pump, wherein

the hydraulic pump of the separate hydraulic circuit is controlled by means of a control unit including an adjustment strategy,

the hydraulic circuit includes a rock drill machine comprising a percussion device and a rotation device, which both are connected to the separate hydraulic circuit,

at least one sensor is arranged in connection with the rock drilling machine for monitoring the operation of the mining actuator,

the results of the monitoring are transmitted from the at least one sensor to the control unit,

and the power of the mining actuator of the rock drilling machine is controlled according to the monitoring results and the adjustment strategy.

21. (Previously Presented): A hydraulic system for mining equipment comprising:

at least one hydraulic circuit with pressure fluid channels and at least one hydraulic pump, the hydraulic pump being arranged to generate hydraulic power in the hydraulic circuit;

at least one power unit for driving the hydraulic pump;

at least one hydraulic mining actuator connected to the hydraulic circuit and configured to act on a tool in the mining equipment;

at least one hydraulic auxiliary actuator connected to the hydraulic circuit; and

means for adjusting the hydraulic power to be led to the mining actuator and the auxiliary actuator connected to the hydraulic circuit, wherein

the hydraulic system comprises a main hydraulic circuit and at least one separate hydraulic circuit, and the main hydraulic circuit and each separate hydraulic circuit are operationally separate from each other, each having a separate hydraulic pump for generating

hydraulic power; at least one mining actuator is connected to the separate hydraulic circuit and said mining actuator is configured to be driven by the hydraulic power acting in the separate hydraulic circuit; and

the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the power of the drilling actuator connected to the separate hydraulic circuit by adjusting the generated hydraulic power by only adjusting the pumping output of the hydraulic pump.

22. (Previously Presented): A method of adjusting the power of a rock drill machine, the rock drill machine comprising at least the following drilling actuators: a percussion device a rotation device and a feed device of which at least one is connected to a hydraulic circuit method comprising:

generating hydraulic power in said hydraulic circuit with at least one hydraulic pump;

driving the drilling actuator connected to the hydraulic circuit by the hydraulic power acting in the hydraulic circuit;

adjusting the power of the drilling actuator connected to the hydraulic circuit by adjusting the hydraulic power to be fed to the drilling actuator;

adjusting the power of the drilling actuator connected to the hydraulic circuit only by adjusting the pumping output of the hydraulic pump.

and the power of the mining actuator of the rock drilling machine is controlled according to the pressure and flow information and the adjustment strategy.

23. (Previously Presented): A hydraulic system for mining equipment comprising:
- at least one hydraulic circuit with pressure fluid channels and at least one hydraulic pump, the hydraulic pump being arranged to generate hydraulic power in the hydraulic circuit;
 - at least one power unit for driving the hydraulic pump;
 - at least one hydraulic mining actuator connected to the hydraulic circuit and configured to act on a tool in the mining equipment;
 - at least one hydraulic auxiliary actuator connected to the hydraulic circuit; and
 - means for adjusting the hydraulic power to be led to the mining actuator and the auxiliary actuator connected to the hydraulic circuit, wherein
- the hydraulic system comprises a main hydraulic circuit and at least one separate hydraulic circuit, and the main hydraulic circuit and each separate hydraulic circuit are operationally separate from each other, each having a separate hydraulic pump for generating hydraulic power; at least one mining actuator is connected to the separate hydraulic circuit and said mining actuator is configured to be driven by the hydraulic power acting in the separate hydraulic circuit; and
- the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the power of the drilling actuator connected to the separate hydraulic circuit by adjusting the generated hydraulic power by adjusting the pumping output of the hydraulic pump, wherein

the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the power of the drilling actuator connected to the separate hydraulic circuit by adjusting the generated pumping output by adjusting the hydraulic pressure generated by the hydraulic pump.

24. (Previously Presented): A method of adjusting the power of a rock drill machine, the rock drill machine comprising at least the following drilling actuators: a percussion device a rotation device and a feed device of which at least one is connected to a hydraulic circuit method comprising:

generating hydraulic power in said hydraulic circuit with at least one hydraulic pump;

driving the drilling actuator connected to the hydraulic circuit by the hydraulic power acting in the hydraulic circuit;

adjusting the power of the drilling actuator connected to the hydraulic circuit by adjusting the hydraulic power to be fed to the drilling actuator; and

adjusting the power of the drilling actuator connected to the hydraulic circuit mainly by adjusting the pumping output by adjusting the displacement capacity of the hydraulic pump.

25. (Previously Presented): A method of adjusting the power of a rock drill machine, the rock drill machine comprising at least the following drilling actuators: a percussion device a

rotation device and a feed device of which at least one is connected to a hydraulic circuit method comprising:

generating hydraulic power in said hydraulic circuit with at least one hydraulic pump;

driving the drilling actuator connected to the hydraulic circuit by the hydraulic power acting in the hydraulic circuit;

adjusting the power of the drilling actuator connected to the hydraulic circuit by adjusting the hydraulic power to be fed to the drilling actuator;

adjusting the power of the drilling actuator connected to the hydraulic circuit mainly by adjusting the pumping output by adjusting the speed of rotation and the displacement capacity of the hydraulic pump.